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PROFILE OF INTESTINAL PROTOZOAN PARASITES IN FARMING COMMUNITIES IN GISTING SUBDISTRICT, TANGGAMUS DISTRICT, LAMPUNG PROVINCE

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ABSTRAK

Infeksi parasit usus masih mejadi masalah kesehatan di komunitas. Survey infeksi protozoa usus di Propinsi Lampung masih terbatas. Penularan infeksi protozoa usus umumnya melalui orofaecal yang berkaitan dengan lingkungan dan prilaku. Petani merupakan salah satu komunitas yang berpotensi terinfeksi. Kecamatan Gisting adalah salah satu sentra pertanian di Provinsi Lampung. Kontak petani dengan lingkungan akan meningkatkan resiko terinfeksi protozoa usus. Penelitian ini bertujuan untuk mengetahui jenis parasit usus yang ditemukan pada komunitas petani. Desain penelitian ini merupakan penelitian survey deskriptif observational. Feses yang dikumpulkan dilakukan pemeriksaan feses parasitologi di Laboratorium Parasitologi Fakultas Kedokteran Universitas Indonesia. Hasil pemeriksaan didapatkan 9,33% spesimen tinja positif parasit protozoa yang terdiri dari *Blastocystis sp* 6,67% dan 1,33% *Entamoeba histolytica/dispar*.sebagai protozoa tunggal, serta 1,33% sebagai campuran *Blastocystis sp* dengan *Endolimax nana*.

ABSTRACT

Profile of Intestinal Protozoan Parasites in Farming Communities in Gisting Subdistrict, Tanggamus District, Lampung Province. Intestinal parasitic infections remain a health problem in communities. Surveys of intestinal protozoan infections in Lampung Province are limited. The transmission of intestinal protozoan infections is generally through the oro-faecal route, which is related to environmental and behavioral factors. Farmers are one of the communities that are potentially infected. Gisting Sub District is one of the agricultural centers in Lampung Province. Farmers' contact with the environment will increase the risk of intestinal protozoan infection. This study aims to determine the Species of intestinal parasites found in farming communities. The design of this study is a descriptive observational survey. Feces collected were examined for parasitological examination at the Parasitology Laboratory, Faculty of Medicine, University of Indonesia. The results showed, the prevalence is 9.33%, consisting of *Blastocystis sp.* protozoa (6.67%), *Entamoeba histolytica/dispar* protozoa (1.33%), and a mixture of *Blastocystis sp*. and *Endolimax nana* (1.33%) among the research subjects.

INTRODUCTION

Intestinal parasitic infections are caused by two groups of parasites: helminths and protozoa. These infections remain a public health concern in communities. Intestinal parasitic infections are generally asymptomatic, especially in immunocompetent individuals. However, in cases of immune suppression or immunocompromised conditions, uncontrolled parasitic growth can lead to a rapid increase in parasite numbers, causing symptoms that may become severe and even fatal. [1–6]

Helminth infections have been extensively studied, including in Lampung Province. Several studies worldwide report that helminthiasis, particularly soil-transmitted helminths (STH), remains prevalent.[6,7] Similar findings have been observed in Indonesia, with Ascariasis and trichuriasis being the most common cases. In Lampung Province, the prevalence of helminthiasis in some areas remains above 50%. Previous studies reported a prevalence of 56.71% in Jati Agung District, South Lampung[8] and 43.1% in Natar District, South Lampung[9] A study conducted in a farming community in Bandar Lampung in 2020 also reported a soil-transmitted helminth (STH) prevalence of 40%[10]

In contrast, studies on protozoan intestinal infections in Lampung Province remain limited. Reports from various researchers indicate that the prevalence of intestinal protozoan infections varies according to species. Studies have identified species such as Giardia lamblia (1.7%–12.5%)[1,2,6,11], *Cryptosporidium sp* (1.2%–15.1%)[1,2,12], *Entamoeba histolytica* (0.17%–6.75%)[2,6,11], *Blastocystis sp* (4.7%–16.2%)[1,2] and other intestinal protozoa. These infections have been observed in asymptomatic individuals, including food handlers, diarrhea patients, and individuals at risk, such as HIV/AIDS patients.[1,2,4,6,11,12]

Risk factors for intestinal protozoan infections are closely associated with poor sanitation, unhygienic lifestyles, inadequate access to clean water, and various behavioral factors. The transmission of intestinal protozoan infections depends on environmental conditions during their life cycle, as some protozoa are waterborne diseases.[5,13,14] Other risk factors influencing intestinal protozoan transmission include social determinants of health, access to fecal disposal facilities, consumption of unwashed raw fruits and vegetables, healthcare accessibility, low socioeconomic status, and inadequate infection prevention programs.[5,15]

Farmers are a community highly susceptible to intestinal protozoan infections and may be neglected in health interventions. A study in a rural community in Chachoengsao Province, Thailand, showed varying prevalence rates of intestinal parasitic infections by species. STH infections were found in 14.3% of cases, while protozoan infections were 1.8%, including *Entamoeba histolytica/dispar* (1.0%), *Giardia intestinalis* (0.4%), and *Blastocystis hominis* (0.4%). Notably, agricultural workers (farmers) had a higher infection rate (19.4% of 129 farmer subjects) compared to non-farmers (11.6% of 95 subjects).[16] Farmers typically reside in rural areas. Gisting District is a rural area in Lampung Province known for its agricultural production, supplying vegetables and other crops to Bandar Lampung City. Farmers' frequent contact with unsanitary environments, open defecation practices, and the use of manure from human or animal feces as fertilizer increase the risk of intestinal parasitic infections for farmers and their families. This study aims to identify the species profile of intestinal parasites found in the farming community of Gisting District, Tanggamus Regency, Lampung Province.

METHODS

This research is a descriptive observational survey. The study population includes farmers residing in Gisting District, Tanggamus Regency, from May to September 2024. The study sample

consists of a subset of this population meeting the inclusion and exclusion criteria. The inclusion criteria require that participants have lived in the study area for at least one consecutive year. The exclusion criteria include farmers who did not submit stool samples or did not complete the questionnaire.

The minimum sample size was determined using a formula for nominal data with a single sample for population proportion estimation.[17] Based on calculations with a 5% significance level (α), a 10% absolute precision (d), and a 17.5% estimated prevalence of intestinal infections in a community[18], the minimum sample size was determined to be 56 subjects.

Subjects were asked to collect stool samples and complete a questionnaire for identity verification. Stool samples underwent parasitological examination using microscopic tests, including direct smear, formalin-ether concentration/sedimentation, and Ziehl-Neelsen modified acid-fast staining. Direct smear and formalin-ether sedimentation with 1% Lugol staining were used to identify trophozoites or cysts of intestinal protozoa and other intestinal parasite species. Ziehl-Neelsen staining was performed to identify *Cryptosporidium sp.*, *Isospora sp.*, and *Cyclospora sp.*. Parasitological stool examinations were conducted at the Parasitology Laboratory, Faculty of Medicine, University of Indonesia.

Data analysis was conducted descriptively, presenting the frequency distribution of each identified species in graphical form. The study received ethical approval from the Health Research Ethics Committee, Faculty of Medicine, University of Lampung (Approval No. 2192/UN26.18/PP.05.02.00/2024).

RESULTS

All study subjects were male, with the majority (66.67%) aged over 50. Most subjects (57.33%) had completed high school or higher education. Microscopic examination detected protozoan parasites in 7 (9.33%) out of 75 stool samples. Parasite identification was based on morphology. The most common protozoan detected was *Blastocystis sp.* in 6 stool samples (8.00%), consisting of 5 cases (6.67%) as single infections and 1 case (1.33%) as a mixed infection with *Endolimax nana*. Additionally, *Entamoeba histolytica/dispar* was found in one stool sample (Fig. 1)

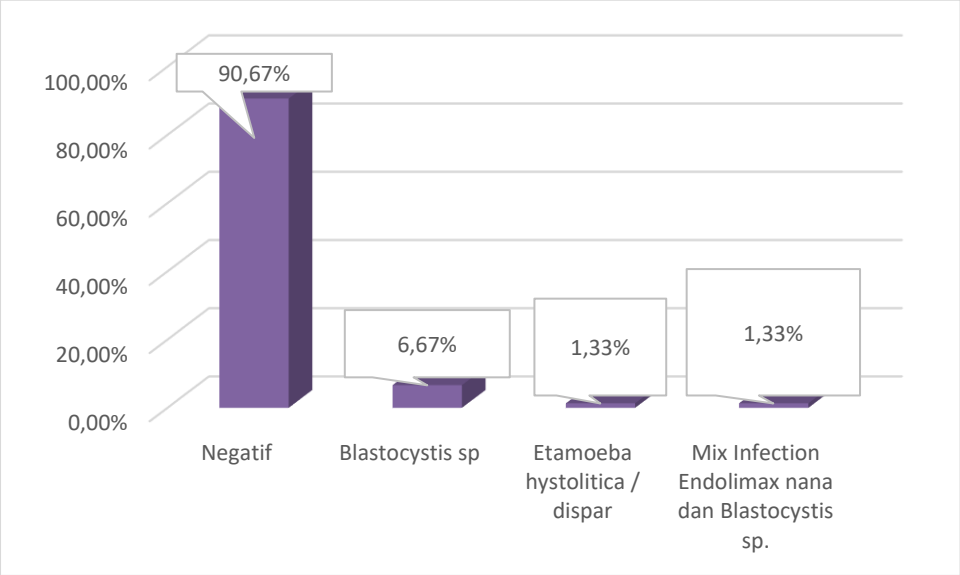

Fig 1. Profile of Species Found on Microscopic Examination

DISCUSSION

This study revealed the presence of intestinal protozoa in asymptomatic individuals, with *Blastocystis sp.* being the most frequently detected parasite. This protozoan has pathogenic potential in humans. Seventeen subtypes of *Blastocystis sp.* have been identified, but only subtypes 1–9 infect humans, with subtypes 1 and 9 being the most common. Certain subtypes exhibit zoonotic potential: subtypes 1, 2, 5, and 8 are found in primates, subtype 4 in rodents, and subtypes 6, 7, and 8 in poultry. Subtypes 10 - 17 are only found in animals.[19–21] Infection with Blastocystis does not consistently produce symptoms and is sometimes asymptomatic.[22] Previous studies have also reported that subtype 2 is associated with diarrhea symptoms, while subtype 1 does not produce diarrhea symptoms.[23] To determine the subtype, molecular testing must be performed. The environment where the farmers of this study live is a rice field area inhabited by animals such as ungulates and rodents. This certainly increases the possibility of contact with animals that can contain these parasites in the environment, so farmers are potentially infected not only from human to human but also from animals. To answer this in detail, molecular testing is necessary to determine the subtype.

Looking at the prevalence rate, the prevalence of *Blastocystis sp.* in the study location is still in line with the prevalence of *Blastocystis sp*. reported from other studies, ranging from 0.4% to 60.4%[16,24–28]. Previous studies have reported symptoms varying from asymptomatic to symptoms such as diarrhea and fever. The symptoms found in previous studies were: only 4.9% had diarrhea, 6.6% had fever, and 26.2% had non-specific gastrointestinal symptoms.[29,30]

In addition to the *Blastocystis sp.* parasite, the protozoan *Entamoeba histolytica/dispar* was also found. Morphologically, it will be difficult to distinguish between *Entamoeba histolytica* and *Entamoeba dispar* because they have the same morphology. However, the two species have different pathogenicity levels. *Entamoeba histolytica* is a pathogenic protozoan, while *Entamoeba dispar* is a non-pathogenic protozoan. To determine this, molecular testing must be performed.[2] Other studies have reported that patients positive for *Entamoeba histolytica* also showed non-specific symptoms.[31] Clinical symptoms range from abdominal pain, mild diarrhea, to severe diarrhea, especially in immunocompromised patients such as HIV/AIDS patients [32–34]

The results of this study are certainly very useful as evidence that in asymptomatic communities, several pathogenic and potentially pathogenic intestinal protozoan parasites can be found. This can be a concern for policymakers to take steps to control the transmission of pathogenic and potentially pathogenic protozoan parasites. Further testing to confirm the subtype is a limitation of this study that was not performed.

CONCLUSION

The conclusion of this study is the discovery of intestinal protozoan parasites in the farming community in Gisting District, Tanggamus Regency, Lampung Province, with a prevalence of 9.33%, consisting of *Blastocystis sp.* protozoa (6.67%), *Entamoeba histolytica/dispar* protozoa (1.33%), and a mixture of *Blastocystis sp*. and *Endolimax nana* (1.33%) among the research subjects.

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